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EXAMINER	
LEE, JOHN R	

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 12/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/620,958	KAJI ET AL.	
	Examiner	Art Unit	
	Anthony Quash	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 July 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *7/16/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 5a, 5b, 6a, 6b, 7b, 8, 8a, 8b, 9a, 50, 51, and 52. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 8 line 11-12, the claim states, "... detecting the intensity of an electron beam passing through the slit as a result of a previous step; ...." However, the claim does not specify which preceding step the claim is referring to. Therefore independent claim 8, and dependent claims 9-10 are rendered indefinite. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1- are rejected under 35 U.S.C. 103(a) as being unpatentable over Oikawa Tetsuo [JP 58-032347]. As per claim 1, Oikawa Tetsuo [JP 58-032347] teaches an electron microscope comprising an electron beam source (1) for emitting an electron beam, an energy filter (7) having an energy dispersion section for dispersing the electron beam according to electron energies, and a slit (40) for selecting the electron beam dispersion by the energy dispersion section, an objective lens (5), an energy filter electron beam detector (43) for detecting an amount of the electron beam selected by the energy filter, wherein the energy dispersion section is adapted selectively to turn on and off, the slit (40) disposed in a trajectory of the electron beam dispersed by the energy dispersion section. However, Oikawa Tetsuo [JP 58-032347] does not explicitly state that the electron beam bypasses the slit when the energy dispersion section is turned off. Instead Oikawa Tetsuo [JP 58-032347] teaches that the slit can be removed and the beam can be directed to the image plate during the time the dispersion section is turned off which is equivalent to the electron beam bypassing the slit when the energy dispersion section is turned off. See Oikawa Tetsuo [JP 58-032347] abstract, figs. 1,2, col. 6 lines 15-30. Therefore, because these two means of directing a beam of

electrons toward a sample while having the slit removed from the trajectory of the beam were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute the apparatus for the removal of slit in Oikawa Tetsuo [JP 58-032347] for the means for bypassing the slit when the energy dispersion section is turned off in order to have the sample receive the full dosage of the beam.

As per claim 3, Oikawa Tetsuo [JP 58-032347] teaches the energy filter be disposed between the electron beam source and a specimen or downstream the specimen relative to a direction of traveling of the electron beam, and the electron beam selected by the energy filter being employed for observing the specimen. See Oikawa Tetsuo [JP 58-032347] abstract, figs. 1,2, col. 6 lines 15-30.

Claims 2,4,10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oikawa Tetsuo [JP 58-032347] in view of Kundmann [524]. As per claims 2,4, Oikawa Tetsuo [JP 58-032347] teaches all aspects of the claim except for explicitly stating an energy filter control unit, wherein the energy filter control unit is able to adjust one of the trajectory of electron beam and a position of the slit according to a signal, which is generated as a result of shifting an area on the slit illuminated by the electron beam and detected by the energy filter electron beam detector, while the energy dispersion section is turned on. However, Oikawa Tetsuo [JP 58-032347] does teach an electron microscope wherein the energy filter, slit, deflectors and lenses are connected to switch in order to carryout rapid change-overs. See Oikawa Tetsuo [JP 58-032347] abstract, and figs. 1-3. Kundmann [524] teaches an energy filter control unit (112,126), wherein

the energy filter control unit (112,126) is able to adjust one of the trajectory of electron beam and a position of the slit (128) according to a signal, which is generated as a result of shifting an area on the slit illuminated by the electron beam and detected by the energy filter electron beam detector, while the energy dispersion section is turned on. See Kundmann [524] abstract, figs. 1,2,4, col. 1 lines 35-67, col. 2 lines 20-45, col. 3 lines 30-40, 55-67, col. 4 lines 25-45, col. 5 lines 48-68, column 6, col. 7 lines 3-12, col. 8 lines 15-56, and col. 9 lines 4-10, 15-22, 45-51, col. 12 lines 58-65, and col. 16 lines 34-40. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made have an energy filter control unit, wherein the energy filter control unit is able to adjust one of the trajectory of electron beam and a position of the slit according to a signal, which is generated as a result of shifting an area on the slit illuminated by the electron beam and detected by the energy filter electron beam detector, while the energy dispersion section is turned on in order to insure proper alignment of the beam with the slit and aid in producing rapid change-over.

As per claim 5, Kundmann [524] teaches the energy filter control unit (112,126) comprising: a shifting controller for shifting a position of the electron beam on the slit; a signal analyzer for analyzing the position of the electron beam on the slit based on output signals delivered by the shifting controller and energy filter electron beam detector (132,134,130). See Kundmann [524] abstract, figs. 1,2,4, col. 1 lines 35-67, col. 2 lines 20-45, col. 3 lines 30-40, 55-67, col. 4 lines 25-45, col. 5 lines 48-68, column 6, col. 7 lines 3-12, col. 8 lines 15-56, and col. 9 lines 4-10, 15-22, 45-51, col. 12 lines 58-65, and col. 16 lines 34-40. However, Kundmann [524] does not explicitly teach a

deflection coil controller for controlling an energy filter deflection coil, which controls positions of the electron beam at an entrance and an exit of the energy filter. Oikawa Tetsuo [JP 58-032347] does teach means (27-30, Ha, Hb) for controlling the deflection of the beam before and after entering the energy filter (7). See Oikawa Tetsuo [JP 58-032347] abstract and figs. 1-3. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have a controller for controlling an energy filter deflection coil which controls positions of the electron beam at an entrance and exit of the filter in order to insure that the beam entered the filter at the correct trajectory and illuminated the correct/desired portion of the slit.

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krivanek [126] in view of Kundmann [524]. As per claim 8, Krivanek [126] teaches a method for adjusting an electron microscope for observation of a specimen (50), the steps of the method comprising: carrying out dispersion with an energy dispersion section (12) according to electron energies for an electron beam before the electron beam illuminates the specimen (50) or after the electron beam transmits through the specimen (50) selecting the post-dispersion electron beam with an energy filter having a slit (30) including at least two shields (see fig. 2 of Krivanek [126], wherein the sides of the slit act as shields); employing the electron beam selected with the energy filter for the observation of the specimen (50), wherein the method further comprises: detecting the intensity of an electron beam passing through the slit (30) as a result of a previous step; and controlling the position of the electron beam on the slit according to

a change in the intensity. See Krivanek [126] abstract, figs. 1-2, col. 3 lines 1-60, column 4, col. 5 lines 20-55, and col. 6 lines 50-65. However, Krivanek [126] does not specifically teach repeated shifting of a position of the selected electron beam on the slit at least once from a first position where the selected electron beam is intercepted by a first shield, via an opening of the slit, to a second position where the selected electron beam is intercepted again by a second shield. Kundmann [524] does teach repeatedly shifting of a position of the selected electron beam on the slit at least once from a first position where the selected electron beam is intercepted by a first shield (U in fig. 2 of Kundmann [524]), via an opening of the slit (128s), to a second position where the selected electron beam is intercepted again by a second shield (L in fig. 2 of Kundmann [524]). See Kundmann [524] abstract, figs. 1-2,3-11, col. 1 lines 35-67, column 2, col. 3 lines 30-40, 55-67, col. 4 lines 25-45, col. 5 lines 50-67, columns 6-7, col. 8 lines 20-57, col. 9 lines 5-10,15-22,45-50, col. 12 lines 59-65, and col. 16 lines 35-40. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to repeatedly shifting of a position of the selected electron beam on the slit at least once from a first position where the selected electron beam is intercepted by a first shield, via an opening of the slit, to a second position where the selected electron beam is intercepted again by a second shield in order to aid in the alignment, and filtering of the electron beam.

As per claim 9, Kundmann [524] teaches shifting one of each shield and the whole slit back and forth at least once; detecting the intensity of an electron beam

passing through the opening of the slit corresponding to displacement of the slit; and controlling the position of the electron beam on the slit according to the displacement of the slit and a change in the intensity of the electron beam. See Kundmann [524] abstract, figs. 1-2,3-11, col. 1 lines 35-67, column 2, col. 3 lines 30-40, 55-67, col. 4 lines 25-45, col. 5 lines 50-67, columns 6-7, col. 8 lines 20-57, col. 9 lines 5-10,15-22,45-50, col. 12 lines 59-65, and col. 16 lines 35-40.

As per claim 10, Kundmann [524] teaches shifting an area illuminated by an electron beam by a larger distance than a width of the opening of the slit; detecting the intensity of the electron beam passing through the opening of the slit corresponding to displacement of the electron beam; and controlling the position of the electron beam on the slit according to the displacement of the electron beam and a change in the intensity of the electron beam. See Kundmann [524] abstract, figs. 1-2,3-11, col. 1 lines 35-67, column 2, col. 3 lines 30-40, 55-67, col. 4 lines 25-45, col. 5 lines 50-67, columns 6-7, col. 8 lines 20-57, col. 9 lines 5-10,15-22,45-50, col. 12 lines 59-65, and col. 16 lines 35-40.

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuno [2001/0052744] in view of Kundmann [524]. As per claim 8, Tsuno [2001/0052744] teaches a method for adjusting an electron microscope for observation of a specimen (33), the steps of the method comprising: carrying out dispersion with an energy dispersion section (22) according to electron energies for an electron beam before the electron beam illuminates the specimen (33) or after the electron beam transmits through the specimen (33) selecting the post-dispersion electron beam with

an energy filter having a slit (24) including at least two shields (4_1,4_2); employing the electron beam selected with the energy filter for the observation of the specimen (33), wherein the method further comprises: detecting the intensity of an electron beam passing through the slit (24) as a result of a previous step; and controlling the position of the electron beam on the slit according to a change in the intensity. See Tsuno [2001/0052744] abstract, figs. 1,5,9-12, paragraphs [0001-0018], [0032], [0034], [0041], [0044-0045], [0054], and [0057-0058]. However, Tsuno [2001/0052744] does not specifically teach repeated shifting of a position of the selected electron beam on the slit at least once from a first position where the selected electron beam is intercepted by a first shield, via an opening of the slit, to a second position where the selected electron beam is intercepted again by a second shield. Kundmann [524] does teach repeatedly shifting of a position of the selected electron beam on the slit at least once from a first position where the selected electron beam is intercepted by a first shield (U in fig. 2 of Kundmann [524]), via an opening of the slit (128s), to a second position where the selected electron beam is intercepted again by a second shield (L in fig. 2 of Kundmann [524]). See Kundmann [524] abstract, figs. 1-2,3-11, col. 1 lines 35-67, column 2, col. 3 lines 30-40, 55-67, col. 4 lines 25-45, col. 5 lines 50-67, columns 6-7, col. 8 lines 20-57, col. 9 lines 5-10,15-22,45-50, col. 12 lines 59-65, and col. 16 lines 35-40. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to repeatedly shifting of a position of the selected electron beam on the slit at least once from a first position where the selected electron beam is intercepted by a first shield, via an opening of the slit, to a second position where the selected electron beam

is intercepted again by a second shield in order to aid in the alignment, and filtering of the electron beam.

As per claim 9, Kundmann [524] teaches shifting one of each shield and the whole slit back and forth at least once; detecting the intensity of an electron beam passing through the opening of the slit corresponding to displacement of the slit; and controlling the position of the electron beam on the slit according to the displacement of the slit and a change in the intensity of the electron beam. See Kundmann [524] abstract, figs. 1-2,3-11, col. 1 lines 35-67, column 2, col. 3 lines 30-40, 55-67, col. 4 lines 25-45, col. 5 lines 50-67, columns 6-7, col. 8 lines 20-57, col. 9 lines 5-10,15-22,45-50, col. 12 lines 59-65, and col. 16 lines 35-40.

As per claim 10, Kundmann [524] teaches shifting an area illuminated by an electron beam by a larger distance than a width of the opening of the slit; detecting the intensity of the electron beam passing through the opening of the slit corresponding to displacement of the electron beam; and controlling the position of the electron beam on the slit according to the displacement of the electron beam and a change in the intensity of the electron beam. See Kundmann [524] abstract, figs. 1-2,3-11, col. 1 lines 35-67, column 2, col. 3 lines 30-40, 55-67, col. 4 lines 25-45, col. 5 lines 50-67, columns 6-7, col. 8 lines 20-57, col. 9 lines 5-10,15-22,45-50, col. 12 lines 59-65, and col. 16 lines 35-40.

Allowable Subject Matter

Claims 6-7 are deemed allowable over the prior art of record.

The following is a statement of reasons for the indication of allowable subject matter: With respect to independent claim 6 and dependent claim 7, the prior art of record does not disclose nor teach, "... a secondary electron detector for detecting an amount of secondary electrons emitted by a specimen illuminated by the electron beam, wherein the energy dispersion section is adapted selectively to turn on and off and the electron microscope comprises an energy filter control unit which cyclically shifts an area on the slit illuminated by the electron beam while the energy dispersion section is turned on, thereby pinpointing the area based on signals delivered by the secondary electron detector, so that one of a trajectory of the electron beam and a position of the slit can be adjusted," in combination with the rest of the claim. Since this aspect is not taught nor disclosed in the prior art of record. Independent claim 6, and dependent claim 7 are deemed allowable over the prior art of record.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Nos. 6,495,826 to Tsuno, 6,140,645 to Tsuno, 6,150,657 to Kimoto et al, 4,812,652 to Egle et al, 6,624,412 to Tanaka et al, and 6,384,412 to Krahl et al. Tsuno [826] is considered pertinent due to its discussion on a

monochrometer for an electron beam. Tsuno [645] is considered pertinent due to its discussion on a transmission electron microscope having an energy filter. Kimoto [657] is considered pertinent due to its discussion on an energy filter and electron microscope equipped with the energy filter. Egle [652] is considered pertinent due to its discussion on an imaging method and apparatus for electron microscopes. Tanaka [412] is considered pertinent due to its discussion on an omega type energy filter. Krahl [412] is considered pertinent due to its discussion on an electron microscope with an energy filter having hexapole correctors, which are coupled with a projective system downstream of the energy filter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Quash whose telephone number is (703)-308-6555. The examiner can normally be reached on M-F from 9 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee, can be reached on (703)-308-4116. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0956 or to the official fax number (703)-872-9306.

A. Quash 12/12/03

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